

Appl. No. 10/728,310  
Response to Office Action  
Dated September 20, 2005

#### REMARKS/ARGUMENTS

Applicants acknowledge receipt of the Office Action dated September 20, 2005. Claims 1-56 are pending in the application. Please note that claims 1, 10, 17, 26, 34, and 40 are independent claims. Claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51 are rejected under 35 U.S.C. § 103 as being unpatentable over Johnson et al., U.S. Patent No. 3,755,488 ("Johnson") in view of Collins, U.S. Patent No. 4,126,645 ("Collins") and Obenaus et al., U.S. Patent No. 4,517,395 ("Obenaus"). In addition, the Examiner has rejected claims 4-9, 13-16, 22-25, 29-33, 35, 36, 38, 39, and 52-55 under 35 U.S.C. § 103 as being unpatentable over *Johnson* in view of *Collins* and *Obenaus* as applied to claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51 and further in view of Dai et al., U.S. Patent Publication No. 2002/0068843 ("Dai"). Furthermore, the Examiner has rejected claims 4-9, 13-16, 22-25, 29-33, 35-37, 39, 52-54, and 56 under 35 U.S.C. § 103 as being unpatentable over *Johnson* in view of *Collins* and *Obenaus* as applied to claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51 and further in view of GB 871804 ("GB Patent"). Applicants believe all pending claims are allowable over the art of record and respectfully request reconsideration and allowance of all claims.

**I. Claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51 are patentable over *Johnson* in view of *Collins* and *Obenaus*.**

Applicants respectfully traverse the Examiner's rejections of claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51 under § 103 as being unpatentable over *Johnson* in view of *Collins* and *Obenaus*. Applicants submit that, contrary to MPEP section 2143, the Examiner has failed to make a *prima facie* case of obviousness in rejecting such claims in that (1) the Examiner has failed to cite references that teach or suggest all of the elements recited in the rejected claims, and (2) the Examiner has failed to articulate a suggestion to combine the references with a reasonable expectation of success.

Claims 1, 10, 17, 26, 34, and 40 are independent claims upon which claims 2-3, 11-12, 18-21, 27-28, and 41-51 depend, respectively. Claim 1 recites "preparing a reactant stream comprising an alkyne absorbed in a liquid absorbent" and "contacting the reactant stream with a

Appl. No. 10/728,310  
Response to Office Action  
Dated September 20, 2005

selective hydrogenation catalyst in the presence of a gas stream comprising hydrogen and greater than 2000 ppm carbon monoxide." Claim 10 recites "contacting an alkyne absorbed in a liquid absorbent with a catalyst in the presence of a hydrogen-containing stream . . . wherein the hydrogen-containing stream further comprises greater than 2,000 ppm carbon monoxide." Claim 17 recites "absorbing one or more alkynes in a liquid absorbent to provide a reactant stream" and "contacting said reactant stream with a catalyst in the presence of a hydrogen-containing gas stream, comprising greater than 2000 ppm carbon monoxide." In addition, claim 26 recites "absorbing one or more acetylenic compounds in a liquid polar non-hydrocarbon absorbent to provide a reactant stream" and "contacting the reactant stream with a hydrogenation catalyst in the presence of a gas stream comprising hydrogen and greater than 2000 ppm carbon monoxide." Moreover, claim 34 recites "preparing a liquid reactant stream comprising between 0.5 wt-% and 10 wt-% C<sub>2</sub>H<sub>2</sub> dissolved in n-methyl-2-pyrrolidone" and "contacting the reactant stream and a gas stream comprising a mixture of H<sub>2</sub> and greater than 2000 ppm CO in continuous flow." Furthermore, claim 40 recites "absorbing an alkyne compound in a liquid polar non-hydrocarbon absorbent to provide a reactant stream" and "contacting the reactant stream with a selective hydrogenation catalyst in the presence of a gas stream comprising hydrogen and greater than 2000 ppm carbon monoxide."

Nothing in *Johnson* teaches or suggests contacting the reactant stream with a catalyst in the presence of a gas stream comprising greater than 2000 ppm carbon monoxide or a hydrogen-containing stream comprising greater than 2000 ppm carbon monoxide.

These missing limitations cannot be supplied by *Collins*. *Collins* does not teach contacting the reactant stream with a catalyst in the presence of a gas stream comprising greater than 2000 ppm carbon monoxide or a hydrogen-containing stream comprising greater than 2000 ppm carbon monoxide. Instead, *Collins* teaches optionally adding carbon monoxide at a concentration less than 2000 ppm. For instance, *Collins* teaches "[i]n a tail-end hydrogenation the proportion [of carbon monoxide] is suitably in the range of **4.0 to 500 ppm v/v**; it may be added deliberately if fractionation of the crude gas has removed it or left too little of it." (*Collins*, col. 5, lns. 26-29, emphasis added) Likewise, the examples in *Collins* all utilize less than 2000 ppm carbon monoxide. For instance, *Collins* teaches that "[t]hese test conditions were

Appl. No. 10/728,310  
Response to Office Action  
Dated September 20, 2005

sirnilar to those in Example 1 except for quantities of the hydrogen stream (*800 ppm CO*) used." (*Collins*, col. 7, lns. 27-29, emphasis added) *Collins* also teaches the presence of carbon monoxide in a front-end hydrogenation. (*Collins*, col. 5, lns. 14-17) However, the carbon monoxide and hydrogen are not taught as being added as a separate stream but instead are already present as by-products with the hydrocarbons containing a "large hydrogen content." (*Collins*, col. 1, lns. 29-38; col. 5, lns. 16-17)

Additionally, the missing limitations cannot be supplied by *Obenaus*. *Obenaus* does not teach or suggest contacting the reactant stream with a catalyst in the presence of a gas stream comprising greater than 2000 ppm carbon monoxide or a hydrogen-containing stream comprising greater than 2000 ppm carbon monoxide. The Examiner contends that *Obenaus* "discloses that any amount of carbon monoxide present above a minimum amount during the liquid phase hydrogenation of hydrocarbons provides for the advantage of selective hydrogenation." (Office Action, pg. 4, lns. 5-7) Applicants respectfully submit that *Obenaus* does not provide such disclosure. Instead, *Obenaus* teaches a maximum amount of carbon monoxide during liquid phase hydrogenation. For instance, *Obenaus* teaches that "[d]osages of [carbon monoxide] **above 20 ppm** by weight **no longer improve**, as experience as shown, the results attainable under the other selected conditions." (*Obenaus*, col. 3, lns. 4-7) Thus, *Obenaus* teaches that carbon monoxide dosages of greater than 20 ppm are no longer effective for improving selective hydrogenation. Accordingly, not only does *Obenaus* fail to supply the missing limitations, but it also teaches away from the limitations.

Therefore, since *Johnson* in view of *Collins* and *Obenaus* do not teach or suggest all elements claimed by Applicants in independent claims 1, 10, 17, 26, 34, and 40, it is submitted that contrary to MPEP § 2143 the Examiner has not articulated a *prima facie* case of obviousness with respect to such independent claims as well as dependent claims 2-3, 11-12, 18-21, 27-28, and 41-51, because the cited references fail to teach all the elements recited in the independent claims to which such dependent claims ultimately refer.

In addition, contrary to MPEP § 2143, the Examiner has failed to show any motivation or suggestion to combine *Johnson* and *Obenaus* with a reasonable expectation of success with respect to claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51. For example, *Johnson* teaches a

Appl. No. 10/728,310  
Response to Office Action  
Dated September 20, 2005

column containing pressurized hydrogen as a continuous phase and a hydrocarbon liquid that trickles downward over a catalyst. (*Johnson*, col. 3, lns. 22-24) Thus, the reactor column in *Johnson* already contains gaseous hydrogen. On the other hand, *Obenau*s teaches a process in which hydrogen and carbon monoxide are added to the hydrocarbon mixture in such ratios "that in *all cases* a *homogenous liquid* phase is obtained before the hydrocarbon mixture enters the hydrogenation zone." (*Obenau*s, col. 2, lns. 10-15 and 18-21) Furthermore, *Obenau*s teaches "[a] homogenous liquid phase exists on the catalyst, *not a gaseous phase*; in other words, hydrogen (H<sub>2</sub>) and carbon monoxide (CO) are *completely dissolved* in the HC mixture to be hydrogenated." (*Obenau*s, col. 2, lns. 28-30) *Obenau*s thus teaches away from *Johnson* as *Johnson* teaches a column containing a hydrogen phase. Therefore, Applicants respectfully submit that there is no reasonable expectation of success in modifying the hydrogenation process of *Johnson* with *Obenau*s.

Accordingly, the Examiner has not articulated a *prima facie* case of obviousness with respect to claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51, and Applicants respectfully request that the Examiner withdraw the § 103 rejections and allow such claims.

**II. Claims 4-9, 13-16, 22-25, 29-33, 35, 36, 38, 39, and 52-55 are patentable over *Johnson* in view of *Collins* and *Obenau*s and further in view of *Dai*.**

Applicants respectfully traverse the Examiner's rejections of claims 4-9, 13-16, 22-25, 29-33, 35, 36, 38, 39, and 52-55 under § 103 as being unpatentable over *Johnson* in view of *Collins* and *Obenau*s as applied to claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51, and further in view of *Dai*. Applicants submit that, contrary to MPEP section 2143, the Examiner has failed to make a *prima facie* case of obviousness in rejecting such claims in that the Examiner has failed to cite references that teach or suggest all of the elements recited in the rejected claims.

Claims 4-9 are dependent upon independent claim 1, and claims 13-16 are dependent upon independent claim 10. Claims 22-25 are dependent on claim 17. Furthermore, claims 29-33 are dependent upon independent claim 26. In addition, claims 35, 36, 38, and 39 are dependent upon independent claim 34, and claims 52-55 are dependent upon independent claim

Appl. No. 10/728,310  
Response to Office Action  
Dated September 20, 2005

40. As noted above in section I, independent claims 1, 10, 17, 26, 34, and 40 are patentable over *Johnson* in view of *Collins* and *Obenaus*. *Dai* cannot supply the missing recitations to *Johnson* in view of *Collins* and *Obenaus*. For instance, nowhere does *Dai* teach or suggest contacting the reactant stream with a gas stream having greater than 2000 ppm carbon monoxide. Therefore, nothing in *Johnson* in view of *Collins* and *Obenaus* and further in view of *Dai* teaches or suggests all of the elements of independent claims claim 1, 10, 17, 26, 34, and 40, and thus ultimately as recited in claims 4-9, 13-16, 22-25, 29-33, 35, 36, 38, 39, and 52-55.

**III. Claims 4-9, 13-16, 22-25, 29-33, 35-37, 39, 52-54, and 56 are patentable over *Johnson* in view of *Collins* and *Obenaus* and further in view of *GB Patent*.**

Applicants respectfully traverse the Examiner's rejections of claims 4-9, 13-16, 22-25, 29-33, 35-37, 39, 52-54, and 56 under § 103 as being unpatentable over *Johnson* in view of *Collins* and *Obenaus* as applied to claims 1-3, 10-12, 17-21, 26-28, 34, and 40-51, and further in view of *GB Patent*. Applicants submit that, contrary to MPEP section 2143, the Examiner has failed to make a *prima facie* case of obviousness in rejecting such claims in that the Examiner has failed to cite references that teach or suggest all of the elements recited in the rejected claims.

Claims 4-9 are dependent upon independent claim 1, and claims 13-16 are dependent upon independent claim 10. Claims 22-25 are dependent upon independent claim 17. Furthermore, claims 29-33 are dependent upon independent claim 26. In addition, claims 35-37 and 39 are dependent upon independent claim 34, and claims 52-54 and 56 are dependent upon independent claim 40. As noted above in section I, independent claims 1, 10, 17, 26, 34, and 40 are patentable over *Johnson* in view of *Collins* and *Obenaus*. *GB Patent* cannot supply the missing recitations to *Johnson* in view of *Collins* and *Obenaus*. Nowhere does *GB Patent* teach or suggest contacting the reactant stream with a gas stream having greater than 2000 ppm carbon monoxide. Therefore, nothing in *Johnson* in view of *Collins* and *Obenaus* and further in view of *GB Patent* teach or suggest all of the elements of independent claims 1, 10, 17, 26, 34, and 40, and thus ultimately as recited in claims 4-9, 13-16, 22-25, 29-33, 35-37, 39, 52-54, and 56.

Appl. No. 10/728,310  
Response to Office Action  
Dated September 20, 2005

#### IV. Conclusion

Applicants respectfully request reconsideration, allowance of the pending claims and a timely Notice of Allowance be issued in this case. If the Examiner feels that a telephone conference would expedite the resolution of this case, the Examiner is respectfully requested to contact the undersigned.

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art that have yet to be raised, but which may be raised in the future.

If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,



Tod T. Tumey  
PTO Reg. No. 47,146  
CONLEY ROSE, P.C.  
P.O. Box 3267  
Houston, TX 77253-3267  
(713) 238-8000 (Phone)  
(713) 238-8008 (Fax)  
ATTORNEY FOR APPLICANTS